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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/665,412	09/18/2003	Karin Schlicht	335.7697USU	4389

7590 08/11/2004
Paul D. Greeley, Esq.
Ohlandt, Greeley, Ruggiero & Perle, L.L.P.
One Landmark Square, 10th Floor
Stamford, CT 06901-2682

EXAMINER

SAGAR, KRIPA

ART UNIT PAPER NUMBER

1756

DATE MAILED: 08/11/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/665,412

Applicant(s)

SCHLICHT ET AL.

Examiner

Kripa Sagar

Art Unit

1756

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 18 September 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-68 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-68 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 18 September 2002 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date: _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 1-20,22-42,57-67 are rejected under 35 U.S.C. 102(e) as being anticipated by US PG PUB.2004/0076910 to Rutter et al.

Rutter teaches the resist stripping method of claims 1,22,57 (#0054-#0055). It teaches a stack of the instant claims (#0018). It teaches silicon-bearing (CA) chemically amplified photoresist (#0022) coated on an [cl.3,24,59] organic underlayer (#0020) over a substrate. The rework may be of exposed or unexposed [cl.4,25,60] resist (#0028, see also example 4). The steps are recited in #0014-#0015. The stripping solvents [1,22,57,7,8,9,28,29,30,63,64,65] are known in the art and recited by Rutter (#0043-#0045). The rework steps are explicit in example 7 (#0054-0055). Substrates [cl.2,23,58] are taught in #0019. Example 7 teaches the elements of claims 10-13 [and 31-34] with puddle and spin stripping a substrate on a track. The times temperatures and spin speeds (#0041) are discussed (#0034-#0036). Water-rinsing and nitrogen-drying are known in the art and taught in #0047 [cl.14-21,35-43,66-68]. Water rinsed stacks are baked.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1-68 are rejected under 35 U.S.C. 103(a) as being unpatentable over US PG PUB.2004/0076910 to Rutter et al.

Rutter teaches the resist stripping method of claims 1,22,57 (#0054-#0055). It teaches a stack of the instant claims (#0018). It teaches silicon-bearing (CA) chemically amplified photoresist (#0022) coated on an [cl.3,24,59] organic underlayer (#0020) over a substrate. The rework may be [cl.4,25,60] of exposed or unexposed resist (#0028, see also example 4). The rework steps are recited in #0014-#0015. The stripping solvents [1,22,57,7,8,9,28,29,30,63,64,65] are known in the art and recited by Rutter (#0043-#0045). The rework steps are explicit in example 7 (#0054-0055). Substrates [cl.2,23,58] are taught in #0019. Example 7 teaches the elements of claims 10-13 [and 31-34] with puddle and spin stripping a substrate on a track. The times temperatures and spin speeds (#0041) are discussed (#0034-#0036). Water rinsing and nitrogen-drying are known in the art and taught in #0047 [cl.14-21,35-43,66-68]. Water rinsed stacks are baked.

The rework steps of claims 44-56 are implicitly taught throughout the body of the specification (e.g. #0025-#0027) and in the examples. These steps, it may be noted, are conventional and not shown to be critical to the instant invention.

Rutter does not teach the specific element of claims 21,43,68. The baking temperature exemplified by Rutter is 90 deg.C. However Rutter remarks that where the solvent- removing moiety is different from the solvent itself, a hard-baking step is needed to remove the second moiety (#0041). It would have been obvious to one of ordinary skill in the art to determine the hard baking temperature and times required to eliminate water (which is used to rinse the solvent) from the stack because incomplete drying leads to poor adhesion of the photoresist in the re-work step, product defects and loss of productivity.

5. Claims 1,22,57 are rejected under 35 U.S.C. 103(a) as being unpatentable over US Pat.6159646 to Jeon et al. in view of US Pat.6200724 to Namiki et al.

Jeon teaches conventional rework steps (fig.5D,6-8) and organic solvents (col.3;lines.16-39).

Namiki teaches a CA-photoresist containing Si (6;43-60) and a novel dissolution inhibitor. Namiki teaches that the resist is a conventional negative tone resist wherein the unexposed areas may be dissolved by an organic solvent (18;60-65). The solvent would be useful in stripping the resist – this is well known in the art.

Jeon does not discuss Si-bearing resists. It would have been obvious to one of ordinary skill in the art at the time the invention was made to substitute Namiki's Si-bearing resist with improved-dissolution inhibitor in Jeon's process because the novel resist is easily soluble in conventional organic solvents including ethyl-lactate used by Jeon and in addition provides fine patterns with high resolution (29;58-30;14)

Art Unit: 1756

6. Claim 1 is rejected under 35 U.S.C. 103(a) as being unpatentable over US 5964951 to Yamamoto et al. in view of Namiki.

Yamamoto teaches a stripping solution (2;9-16) for removing resists from wafers. The steps include forming an antireflective underlayer (ARC) on a substrate, coating a photoresist and patterning the resist. The stripper may also be used for edge-bead removal (unexposed areas. 4;27-5;5). Chemically amplified positive and negative tone resists may be stripped (3;11-25). The organic solvents in the stripper are conventional and cover the instant specified compounds (2;45-58).

Removal of the stripping solution from the surface is conventional in the art for further processing of the substrate.

Namiki teaches a CA-photoresist containing Si (6;43-60) and a novel dissolution inhibitor. Namiki teaches that the resist is a conventional positive tone resist wherein the exposed areas are developed in a developer and the *unexposed* areas may be dissolved by an organic solvent (18;60-65). The solvent would be useful in stripping the resist – this is well known in the art.

Yamamoto does not discuss Si-bearing resists. It would have been obvious to one of ordinary skill in the art at the time the invention was made to substitute Namiki's Si-bearing resist with improved-dissolution inhibitor in Yamamoto's process because the novel resist is easily soluble in conventional organic solvents listed by Yamamoto and in addition provides fine patterns with high resolution (29;58-30;14).

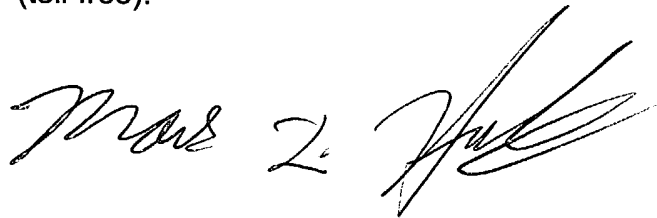
Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kripa Sagar whose telephone number is 571-272-1392. The examiner can normally be reached on M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mark F Huff can be reached on 571-272-1385. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

MH/ks

A handwritten signature in black ink, appearing to read "Mark F. Huff", with a stylized flourish at the end.

MARK F. HUFF
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 1700